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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/603,053	06/26/2000	Hiroshi Shimanuki	CSC-018	3796

959 7590 06/26/2002

LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/26/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/603,053

Applicant(s)

SHIMANUKI ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-13. The claims are newly rejected under 35 USC §112, first paragraph as well as 35 USC §103, as necessitated by amendment. Accordingly, this action is made final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 4, 7, 10, and 12 have been amended to recite that the temperature and/or flowrate of the cooling medium is controlled depending on the change of the amount of water discharged from the fuel cell. However, the application as originally filed does not appear to support this recitation. The specification and drawings disclose sensors for measuring various temperatures and the fuel cell electrical output, but there appears to be no contemplation or disclosure of basing the control scheme on an amount (e.g.,

flowrate) of water discharged from the fuel cell. Accordingly, this limitation is believed to introduce new matter into the application.

Claim Rejections - 35 USC § 103

4. Claims 1-4, 7, 8, and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-176784 in view of Ewan et al (U.S. Patent 5,346,778).

In Figures 1, 2, and 4, JP 6-176784 generally teaches a fuel cell system comprising a gas/liquid separator (heat exchanger 2) for recovering water from components discharged from the fuel cell. A cooling medium (water) is circulated to the separator in a closed cooling loop. In paragraph [0030] of the computer-generated translation, the reference teaches temperature (13) and flowrate (14) detecting means of the cooling water entering the heat exchanger. A controller (15) controls a valve (12) in response to these detected values, thereby controlling the flowrate and temperature of the cooling water (see paragraphs [0028]-[0031]). As disclosed in paragraphs [0035] and [0036], the rotational speed of the centrifugal pump (4A) may be controlled instead of the valve.

JP 6-176784 does not expressly teach that the flowrate of the cooling water is controlled in response to the change in flowrate of the product water of the fuel cell.

In Figure 1, Ewan et al. disclose a fuel cell system comprising product water flow sensors (126). As disclosed in Figure 2 and in column 8, lines 15-55, the measurement may be used to control elements of the cooling system such as the pump (75) and fans (85).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the flowrate sensor of Ewan et al. into the system of the Japanese reference. In column 3, line 4, Ewan et al. teach that their control system provides for a fuel cell powered vehicle having “improved efficacy” during operation. Accordingly, the artisan would be motivated to incorporate the flowrate sensor of Ewan et al. into the system of the Japanese reference in order to further control the cooling water temperature and flowrate.

5. Claims 5, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-176784 in view of Ewan et al. as applied to claims 1-4, 7, 8, and 10-13 above, and further in view of Goto (U.S. Patent 6,087,028).

JP 6-176784 further teaches in paragraphs [0010] and [0011] that a problem to be solved by the invention is the uneven transfer of heat caused by the seasonal changes in temperature of the cooling water passing through the cooling tower (3).

The Japanese reference does not expressly teach a radiator in combination with a cooling fan which functions to control the temperature of the cooling water in the cooling loop.

The patent of Goto is generally directed to a cooling system for a fuel cell stack having a closed cooling water loop. As taught in the abstract and Figure 1, the temperature and flowrate of the cooling water are controlled by a fan/radiator system (24, 26) and pump (30), respectively, in response to the sensed temperatures (32, 34) in the coolant loop.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the fan/radiator system of Goto in place of the cooling tower of the Japanese reference. As set forth above, the Japanese reference identifies the control of temperature in the coolant loop as a problem in prior art systems. Therefore, the artisan could reasonably look to the disclosure of Goto for an additional solution to this problem. As disclosed in column 11, lines 30-59 of Goto, the fan and radiator are useful in providing precise temperature control of the cooling water and fuel cell. Accordingly, the artisan would be motivated to use such a radiator and fan in the system of the Japanese reference in an attempt to more precisely control the temperature of the cooling water (i.e., keep it at its set point). It is further noted that there appears to be a symbol denoting a fan in the schematic of the cooling tower (3) in the Japanese reference, which would give the artisan a further suggestion to use a radiator/fan system. Accordingly, these limitations are not considered to distinguish over the references.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700

JSC

June 19, 2002